Detector Development for Polarization Studies of the Cosmic Microwave Background

Completed Technology Project (2011 - 2015)

Project Introduction

Among the most pressing questions remaining in cosmology today are the issues of the true nature of dark energy and the mechanism of inflation. Studies of the polarization anisotropies of the Cosmic Microwave Background provide one of the most promising methods of obtaining insight into these key gaps in our understanding of the origins and evolution of the universe. This proposal is for work on detector and focal plane technology development for the new polarization sensitive receiver for the Atacama Cosmology Telescope (ACTPol). ACTPol aims to directly explore both of these unanswered questions by characterizing the polarization and temperature anisotropies of the CMB at small angular scales. ACTPol will also serve as an important ground-based test of the developing polarimeter technology that will be needed for a future space-based mission to probe the energy scale of inflation. Through the assistance of this NASA fellowship my work on this project will provide key technology development and testing that will increase NASA's ability to fulfill its scientific objectives.

Anticipated Benefits

This project is for work on detector and focal plane technology development for the new polarization sensitive receiver for the Atacama Cosmology Telescope (ACTPol). ACTPol aims to directly explore both the issues of the true nature of dark energy and the mechanism of inflation, by characterizing the polarization and temperature anisotropies of the CMB at small angular scales. ACTPol will also serve as an important ground-based test of the developing polarimeter technology that will be needed for a future space-based mission to probe the energy scale of inflation. Through the assistance of this NASA fellowship my work on this project will provide key technology development and testing that will increase NASA's ability to fulfill its scientific objectives.

Project Image Detector Development for Polarization Studies of the Cosmic Microwave Background

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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Responsible Program:

Space Technology Research Grants

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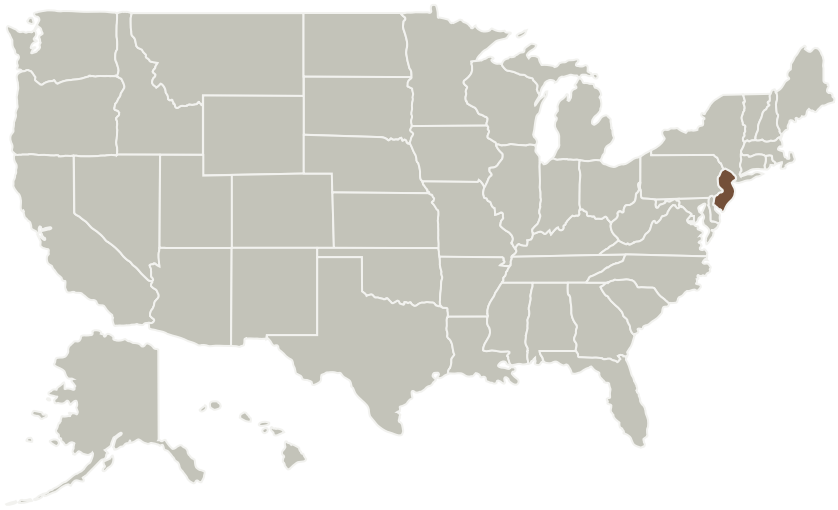
Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
Princeton University	Supporting Organization	Academia	Princeton, New Jersey

Primary U.S. Work Locations
New Jersey

Project Management

Program Director:
Claudia M Meyer

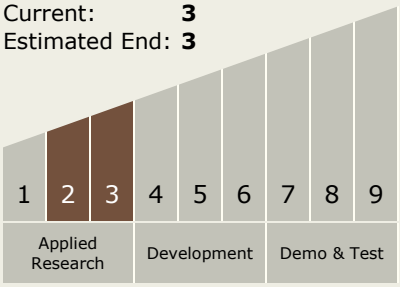
Program Manager:
Hung D Nguyen

Principal Investigator:
Suzanne Staggs

Co-Investigator:
Emily Grace

Technology Maturity (TRL)

Start: **2**
Current: **3**
Estimated End: **3**



Technology Areas

Primary:

- TX08 Sensors and Instruments
  - TX08.1 Remote Sensing Instruments/Sensors
    - TX08.1.1 Detectors and Focal Planes

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Images

4301-1363176792932.jpg
Project Image Detector Development for Polarization Studies of the Cosmic Microwave Background
(https://techport.nasa.gov/image/1740)

Project Website:

https://www.nasa.gov/directorates/spacetech/home/index.html